

Space Science Seminar
Tuesday, 2015 May 19
10:30 a.m.
NSSTC/2096

**Progress Toward a Soft X-ray Polarimeter for
Astrophysics**

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Massachusetts Institute of Technology
Host: Dr. Martin Weisskopf

We present development of a telescope for measuring linear X-ray polarization over the 0.2-0.8 keV band. We employ multilayer-coated mirrors as Bragg reflectors at the Brewster angle. By matching to the dispersion of a spectrometer, one may take advantage of high multilayer reflectivities and achieve polarization modulation factors over 90%. We have constructed a source of polarized X-rays that operates at a wide range of energies with a selectable polarization angle. Previously, we demonstrated that the polarimetry beam-line provides 100% polarized X-rays at 0.525 keV (Marshall et al. 2013). Recently, we upgraded the source by installing a mirror with a laterally graded multilayer (LGML) coating, providing a wide energy range. Recent work includes development of LGMLs with new material combinations (C/CrCo and La/B4C) that have high efficiencies in different soft X-ray bands. We have also sponsored the development of new gratings and will soon begin testing these new gratings. Finally, we will present a design for a small telescope for suborbital or orbital missions. A suborbital mission would be limited to measuring the polarization of a blazar such as Mk 421 to a few percent while an orbital version could measure the polarizations of neutron stars, active galactic nuclei, and blazars.

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